**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

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**EX PARTE Eric J. Larsen et al.**

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**Application for Patent**

**Filed September 15, 2003**

**Application No. 10/663,236**

**FOR:**

# METHOD AND APPARATUS FOR ADJUSTING A VIEW OF A SCENE BEING DISPLAYED ACCORDING TO TRACKED HEAD MOTION

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# APPEAL BRIEF

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CERTIFICATE OF E-FILING

I hereby certify that this correspondence is being electronically deposited with the United States Patent and Trademark Office via EFS-Web on August 23, 2010.

Signed: /David F. Lee/
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## I. REAL PARTY IN INTEREST

The real party in interest is Sony Computer Entertainment Inc., the assignee of the present application.

## II. RELATED APPEALS AND INTERFERENCES

The Appellants are not aware of any related appeals or interferences.

## III. STATUS OF CLAIMS

Claims 1, 6-12, 14-19, 46-50, and 59-61 are pending in the subject application. Claims 2-5, 13, 20-45, and 51-58 have been cancelled, and claims 1, 6-12, 14-19, 46-50, and 59-61 have been rejected and are on appeal.

## IV. STATUS OF AMENDMENTS

Appellants filed a Request for Reconsideration on December 23, 2009, in response to a non-Final Office Action mailed on September 1, 2009. After receiving a second non-Final Office Action mailed on March 17, 2010, Appellants initiated the instant appeal. As no Final Office Action has issued, no amendment has been entered after a Final Office Action.

## V. SUMMARY OF CLAIMED SUBJECT MATTER

According to claimed embodiments of the invention, methods are disclosed for processing interactive user control for a view of a scene displayed on a virtual window. The view of the scene comprises a view-frustum defined by a gaze projection of a location of the head through outer edges of the virtual window. The view-frustum is adjusted in accordance with changes in location of the head of the user, the adjusted view-frustum defined by an updated gaze projection of the changed location of the head through the outer edges of the virtual window. Additionally, a scale of the scene is adjusted according to a change in a distance of the head of the user from a capture device.

Claim 1 defines a method for processing interactive user control for a view of a scene displayed on a virtual window, comprising:

identifying a head of a user that is to interact with the scene; *(page 19, lines 15-16)*

storing an initial frame of user image data representing the head of the user, *(Figure 4, 120a; page 12, line 23 to page 13, line 2)* said view of the scene comprises a view-frustum initially defined by a gaze projection of a location of the head through outer edges of the virtual window when the location of the head is substantially normal to about a center point of the virtual window; *(Figures 6A and 6B; page 15, lines 7-9, 17-19)*

tracking the identified head of the user during display of the scene, the tracking enabling detection of a change in location of the head of the user, the tracking including, *(Figure 5; page 13, line 12 to page 15, line 4)*

identifying a search region within a frame of the user image data; and *(Figure 5; page 13, line 12 to page 15, line 4)*

comparing values within the search region to template values of the stored initial frame of image data; *(Figure 5; page 13, line 12 to page 15, line 4)*

adjusting the view-frustum in accordance with the change in location of the head of the user, the adjusting of the view-frustum being in response to tracking a move in the location of the head away from normal relative to the center point of the virtual window, the adjusted view-frustum defined by an updated gaze projection of the changed location of the head through the outer edges of the virtual window, such that the view-frustum moves in a direction opposite to the move in the location of the head; *(Figure 6B; page 15, line 16 to page 16, line 10)*

adjusting a scale of the scene according to a change in a distance of the head of the user from a capture device; *(Figure 6A; page 15, lines 7-15)* and

repeating the identifying the search region, the comparing, and the adjusting for successive frames of the scene, wherein the comparing is performed with the stored initial frame of image data. *(page 12, line 16)*

Claim 14 defines a method for processing interactive user control with a scene, comprising:

identifying a head of a user that is to interact with the scene; *(page 19, lines 15-16)*

storing an initial frame of image data representing the head of the user for a duration of the scene; *(Figure 4, 120a; page 12, line 23 to page 13, line 2)*

tracking the identified head of the user during display of the scene, the tracking enabling detection of a change in location of the head of the user, the tracking including, *(Figure 5; page 13, line 12 to page 15, line 4)*

identifying a search region within a frame of the image data; and *(Figure 5; page 13, line 12 to page 15, line 4)*

comparing values within the search region to template values of the initial frame of image data; *(Figure 5; page 13, line 12 to page 15, line 4)*

translating a view-frustum in a direction opposite to the change in location of the head of the user while maintaining a focus on an object in the scene through adjustment of a view port size; *(Figure 6B; page 15, line 16 to page 16, line 10; Figure 8; page 17, line 23 to page 18, line 9)*

adjusting a scale of the scene according to a change in a distance of the head of the user from a capture device; *(Figure 6A; page 15, lines 7-15)* and

successively updating the view frustum according to the change in location of the head of the user relative to the initial frame of image data. *(page 12, line 16)*

Claim 46 defines a system enabling interactive user control for defining a visible volume being displayed, comprising:

a computing device; *(Figure 11, 168)*

a display screen in communication with the computing device, the display screen configured to display image data defined through a view-frustum; *(Figure 11, 164)*

a tracking device in communication with the computing device, the tracking device capable of capturing a location change of a control object, *(Figure 11, 116; page 19, lines 2-4)* wherein the location change of the control object effects an alignment of the view-frustum in the opposite direction relative to the display screen, *(Figure 6B, page 15, line 16 to page 16, line 10)* wherein the computing device stores a marker-less reference image

of the control object for comparison to each successive frame of image data captured through the tracking device *(page 19, lines 7-10)* and wherein the computing device adjusts a scale of the display image data according to a change in a distance of the control object from the tracking device, *(Figure 6A; page 15, lines 7-15)* wherein the computing device is configured to adjust a view port size associated with the image data so that when the view frustum is adjusted, focus on an object within the view-frustum is maintained. *(Figure 8; page 17, line 23 to page 18, line 9)*

Claim 59 defines a method for processing interactive user control for a view of a scene displayed on a virtual window, comprising:

identifying a head of a user that is to interact with the scene; *(page 19, lines 15-16)*

storing an initial frame of user image data representing the head of the user, *(Figure 4, 120a; page 12, line 23 to page 13, line 2)* said view of the scene comprises a view-frustum initially defined by a gaze projection of a location of the head through outer edges of the virtual window when the location of the head is substantially normal to about a center point of the virtual window; *(Figures 6A and 6B; page 15, lines 7-9, 17-19)*

tracking the identified head of the user during display of the scene, the tracking enabling detection of a change in location of the head of the user, the tracking including; *(Figure 5; page 13, line 12 to page 15, line 4)*

laterally adjusting the view-frustum in a direction opposite to the change in location of the head of the user, the lateral adjusting of the view-frustum being in response to tracking a move in the location of the head away from normal relative to the center point of the virtual window, the laterally adjusted view-frustum defined by an updated gaze projection of the changed position of the head through the outer edges of the virtual window; *(Figure 6B; page 15, line 16 to page 16, line 10)*

adjusting a scale of the scene according to a change in a distance of the head of the user from a capture device, *(Figure 6A; page 15, lines 7-15)* the capture device having depth capturing capability; *(page 12, lines 5-9)* and wherein the location of the head being away from normal relative to the center point of the virtual window changes an angle of the gaze projection, the change in angle of the gaze projection effects a change in viewing

angle of the scene provided by a video clip. *(Figure 6B; page 15, line 16 to page 16, line 10)*

Claim 61 defines a method for processing interactive user control for a view of a scene displayed on a virtual window, comprising:

identifying a head of a user that is to interact with the scene; *(page 19, lines 15-16)*

storing an initial frame of user image data representing the head of the user, *(Figure 4, 120a; page 12, line 23 to page 13, line 2)* said view of the scene comprises a view-frustum initially defined by a gaze projection of a virtual viewpoint through outer edges of the virtual window when a location of the head is substantially normal to about a center point of the virtual window; *(Figures 6A and 6B; page 15, lines 7-9, 17-19)*

tracking the identified head of the user during display of the scene, the tracking enabling detection of a change in location of the head of the user, the tracking including, *(Figure 5; page 13, line 12 to page 15, line 4)*

laterally adjusting the virtual viewpoint in a same direction as a move in the location of the head away from normal relative to the center point of the virtual window, so as to laterally adjust the view-frustum in a direction opposite to the lateral adjustment of the virtual viewpoint, the laterally adjusted view-frustum defined by an updated gaze projection of the laterally adjusted virtual viewpoint through the outer edges of the virtual window; *(Figure 6B; page 15, line 16 to page 16, line 10)*

adjusting a scale of the scene according to a change in a distance of the head of the user from a capture device. *(Figure 6A; page 15, lines 7-15)*

It should be appreciated that the above description represents only a summary of the present invention. A more in-depth discussion of the present invention is provided in the Detailed Description section of the application.

## VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are presented for review:

A. Whether claims 1, 6-12, 14-19, 46-50, and 59-61 are patentable under 35 U.S.C. § 103(a) over *Kang* (US 6,009,210) in view of *Kanade et al.* ("*Kanade*") (US 6,151,009) and further in view of *Edwards et al.* ("*Edwards*") (US 2003/0169907).

## VII. ARGUMENT

Appellants present the following arguments with respect to the rejected claims:

**A. Rejection of claims 1, 6-12, 14-19, 46-50, and 59-61 under 35 U.S.C. § 103(a) over *Kang* in view of *Kanade,* further in view of *Edwards*.**

**1. <u>Claims 1, 6-12, 14-19, 46-50, and 59-61</u>**

**i. Appellants' independent claim 1 includes a view-frustum defined by a projection of a location through outer edges of a virtual window, and adjusted accordingly.**

Appellants' claim 1 recites a method for processing interactive user control for a view of a scene displayed on a virtual window. A view-frustum is initially defined by a gaze projection of a location of the user's head through outer edges of the virtual window when the location of the head is substantially normal to the center of the virtual window. The view-frustum is adjusted in accordance with the change in location of the head of the user wherein the adjusted view-frustum is defined by an updated gaze projection of the changed location of the head through the outer edges of the virtual window, such that the view-frustum moves in a direction opposite to the move in the location of the head.

One distinguishing feature of the Appellants' claimed invention over the cited prior art lies in the manner in which the claimed view-frustum is defined and adjusted. The view-frustum is defined by a gaze projection of the location of the head through the outer edges of the virtual window. When the user's head moves to a different location, the gaze projection is updated, thereby redefining the view-frustum as the gaze projection of the new location through the outer edges of the virtual window. Thus, when a user moves his/her head in a direction away from normal (e.g. to the left), the view-frustum moves in the opposite direction (to the right).

This may be understood with reference to Figure 6B of the Appellants' specification, reproduced below.

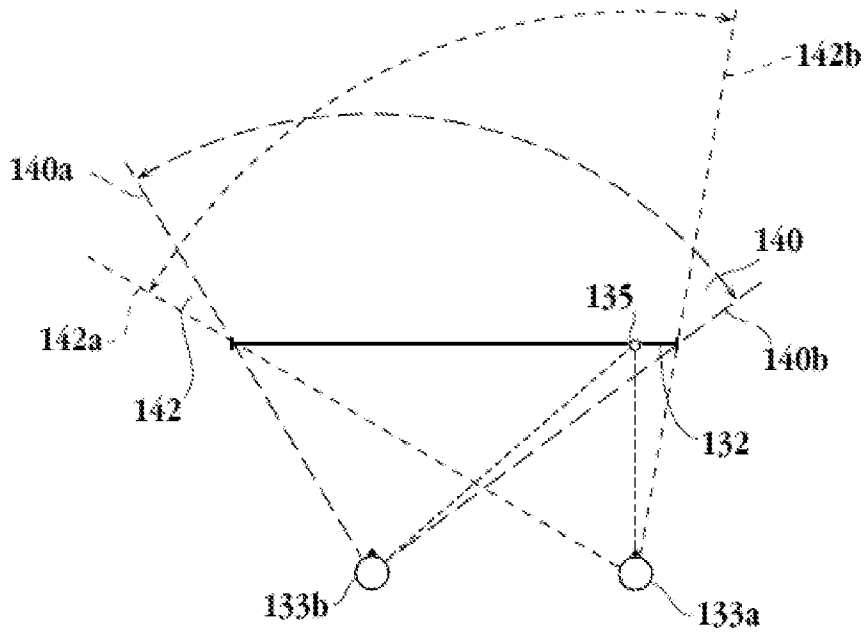



Fig. 6B

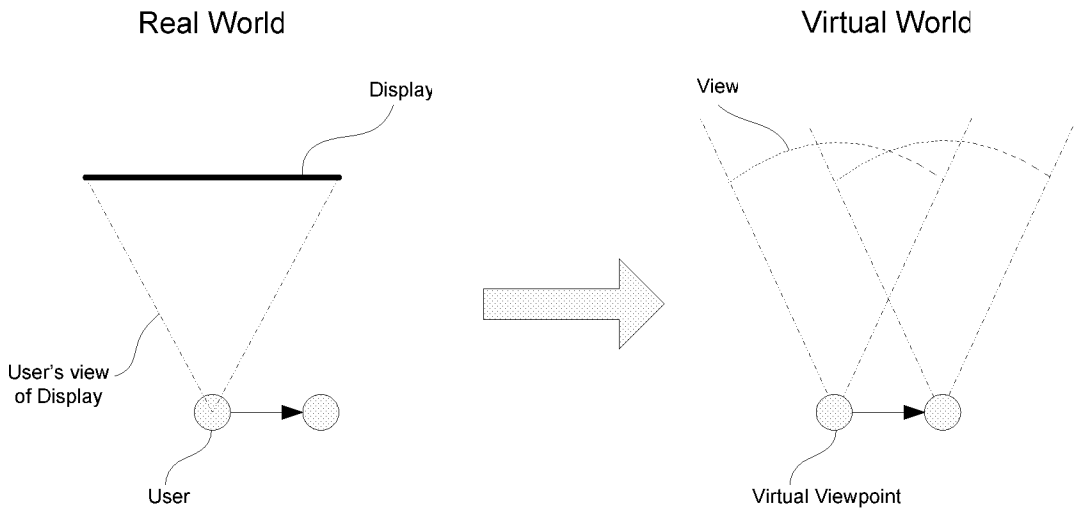
As shown, a user at location 133a has a view-frustum 142 defined by a projection of the location 133a through the outer edges of the virtual window (or view port) 132. When the user moves to location 133b, the user has a new view-frustum 140 defined by a projection of the new location 133b through the outer edges of the virtual window 132. As can be seen, the view-frustum moves in the opposite direction as the movement of the user's location. As the user moves to the left from location 133a to location 133b, the associated view-frustum moves to the right—from view-frustum 142 to view-frustum 140, respectively.

**ii. The *Kang* reference does not disclose a view-frustum defined with reference to a virtual window, nor its adjustment as claimed by the Appellants.**

The *Kang* reference teaches a hands-free navigation system for tracking a head and responsively adjusting the display of a virtual reality environment. *Kang* discloses the tracking of translational and rotational movements of a user's head/face. With regard to

"the problem of using [the tracked movements] to control the viewing of the virtual reality environment" (Col. 8, lines 26-27), *Kang* discloses two methods.

The first method taught is "to directly use the pose parameters to determine the absolute position and orientation of the viewpoint" (Col. 8, lines 27-29). In other words, a viewpoint set within the virtual reality environment is moved in the same manner as is detected in the user's face. Thus, movement of the user's head to the right causes movement of the viewpoint to the right; rotation of the user's head in a clockwise direction causes rotation of the viewpoint in a clockwise direction, etc. This is illustrated by the diagram shown below.




The second method taught by *Kang* applies the same directional system, but incorporates incremental control to "indicate continuous movement within the virtual reality environment" (Col. 8, lines 32-40). In other words, positional or rotational movement of the user's head in a given direction causes continuous movement of the viewpoint in the virtual reality environment in the same manner until the user's head returns to its initial position and orientation.

As can be seen, unlike the Appellants' claimed invention, *Kang* does not teach a view-frustum defined by a gaze projection through a virtual window. Rather, the view defined by *Kang* is tied to the location and orientation of the viewpoint, but not to the outer edges of a virtual window as claimed by Appellants. Thus, when the user's head

moves in a given direction, the viewpoint moves with the user's head—as does the view—in the same direction.

In other words, the adjustment of the view according to *Kang* occurs *independently of the display.* Assuming that a user starts with his head in front of and facing a display, if the user turned or moved his head to the right, then the view would be adjusted to the right (in the virtual world) in accordance with the direction which the user's head has turned/moved. Yet the image from the adjusted view, would still be displayed on the display. According to *Kang's* other control method, where a change in pose causes continuous movement of the virtual reality viewpoint, then the view would continue to move in the direction that the user's head has moved. Yet all the while, the image from that view would be shown on the stationary display. Thus, unlike the Appellants' claimed invention, the view shown on the display according to *Kang's* disclosure is wholly independent of the display.

In contrast to *Kang,* the Appellants' claimed invention defines a view-frustum in a manner which is *dependent* on the display (or virtual window). For the claimed view-frustum is initially defined by a gaze projection of a location of the user's head through outer edges of a virtual window. And when the user's location changes, the view-frustum is adjusted based on an updated gaze projection of the new location of the user's head through the outer edges of the virtual window.

**iii. The *Kanade* reference does not disclose adjustment of a scale of a scene according to a change in distance of the head of a user from a capture device.**

Appellants' claim 1 additionally recites that a scale of the scene is adjusted according to a change in a distance of the head of the user from a capture device. The Office notes that *Kang* does not disclose this feature of the Appellants' claimed invention. However, the Office nonetheless cites the *Kanade* reference as teaching the use of a depth capturing camera for interaction with a view of a scene, and stating that it would have been obvious to modify *Kang* in view of *Kanade* to obtain distance or depth information from the object being tracked and determine any interaction such as occluding, shadowing, reflecting or colliding, and generate appropriate output based on said determination.

Appellants note that interactions such as occluding, shadowing, reflecting or colliding as taught by *Kanade* relate to real-world objects being captured by the depth

camera. Capturing depth information of real-world objects may indeed enable one to determine such interactions among those objects. However, Appellants are unable to discern the determination of interactions among real-world objects relates to the Appellants' claimed adjustment of the scale of a scene displayed on a virtual window based on changes in distance of the head of a user from a capture device. *Kanade* merely teaches the capture of depth information and associated determinations about the objects being captured, but does not teach adjustment of the scale of a displayed scene based on distance from a capture device as claimed.

**iv. The Office ignores relevant subject matter of the Appellants claimed invention.**

The Office states that Appellants' recitation of an adjusted view-frustum defined by an updated gaze projection is interpreted as "as the user moves his/her head, the view-frustum is changed to reflect said change." In other words, the Office appears to interpret Appellants' claimed adjustment of the view-frustum as simply adjusting a view of a user into a virtual world "to reflect" said change in position.

However, such an interpretation ignores relevant portions of Appellants' claimed subject matter. Specifically, the adjusted view-frustum is defined by an updated gaze projection of the changed location of the head through the outer edges of the virtual window, this being in response to a move of the head away from normal relative to the center point of the virtual window. The prior art references do not teach a view-frustum defined with reference to a location of a user's head and a virtual window, much less its adjustment as defined wherein the location of the user's head moves in relation to the virtual window.

Furthermore, Appellants claim 1 recites that the view-frustum moves in a direction opposite to the move in the location of the head. Thus, Appellants do not merely claim adjustment of a view "to reflect" a change in position of a user's head, but rather adjustment of a view-frustum based on updating a gaze projection through a virtual window, such that movements of the head away from normal cause movement of the view-frustum in the opposite direction. By choosing to interpret these limitations as merely adjustments which "reflect" a change in position, Appellants submit that the Office is improperly ignoring the defined subject matter of Appellants' claimed invention.

**v. The *Edwards* reference is unrelated to the Appellants' claimed invention, and does not cure the deficiencies of *Kang* and *Kanade*.**

The *Edwards* reference teaches a method of estimating eye gaze direction based on head pose and analysis of eye position. *Edwards,* Abstract. However, Appellants' claimed invention does not relate specifically to eye gaze direction, but rather a gaze projection defined with reference to a location of a user's head and the outer edges of a virtual window. The claimed invention does not utilize eye gaze direction as defined by *Edwards,* nor is any such concept defined in the Appellants' claimed subject matter. The citation of *Edwards* is irrelevant to the Appellants' claimed invention, and appears to be cited merely due to linguistic similarity of the terms "eye gaze direction" (as defined in *Edwards)* and "gaze projection" (as defined in the Appellants' claims).

Moreover, *Edwards* does not remedy the deficiencies of *Kang* and *Kanade* as discussed above. Namely, *Edwards* does not teach a view-frustum defined by a projection of a location of a user's head through outer edges of a virtual window, nor its adjustment when the location of the user's head changes as claimed. Nor does *Kanade* teach adjustment of a scale of a scene displayed on a virtual window according to a change in distance of the had of the user from a capture device.

**vi. Independent claims 14, 46, 59, 61, and the dependent claims are patentable for at least the same reasons as independent claim 1.**

As discussed, the cited art of record does not disclose the view-frustum and adjustment features as claimed. Therefore, for at least the reasons discussed above, it is submitted that claim 1 is patentable over the teachings of *Kang* and *Kanade.*

Independent claims 14, 46, 59, and 61 include subject matter similar to claim 1. Therefore, these claims are believed to be patentable over the cited prior art for at least the reasons discussed above with respect to independent claim 1. Likewise, dependent claims 6-12, 15-19, 47-50, and 60 are patentable for at least the same reasons as their corresponding independent claims.

**vii. The cited references do not disclose the subject matter of dependent claim 6.**

Dependent claim 6 recites that successive frames are compared to determine a relative distance of the head of the user to manipulate the scale of the scene. As discussed above, the cited references do not disclose the adjustment of the scale of the scene. As such, the references also do not disclose successive comparison of frames in order to manipulate the scale of the scene. The Board is respectfully requested to independently consider the patentability of dependent claim 6.

**viii. The cited references do not disclose the subject matter of dependent claim 7.**

Dependent claim 7 recites that the capture device has depth capturing capability. As discussed above, the cited references do not disclose the adjustment of the scale of the scene according to a change in distance of the head of the user from the capture device. As such, the references also do not disclose the claimed capture device having depth capturing capability in combination with the claimed adjustment of scale. The Board is respectfully requested to independently consider the patentability of dependent claim 7.

**ix. The cited references do not disclose the subject matter of dependent claim 11.**

Dependent claim 11 recites that interaction with the scene by tracking movement of the head of the user is independent of user hand-held controls for interacting with a video game. As discussed above, the cited references do not disclose the claimed method of interaction with the scene by tracking movement of the user's head. As such, the cited references also do not disclose that such interaction is independent of user hand-held controls. The Board is respectfully requested to independently consider the patentability of dependent claim 11.

**x. The cited references do not disclose the subject matter of dependent claim 12.**

Dependent claim 12 recites that the method operation of tracking the head of the user includes tracking a facial portion and matching gray scale image data associated with the facial portion to a template of the facial portion. As discussed above, the cited

references do not disclose the claimed method of tracking the head of the user for adjustment of a view-frustum. As such, the references also do not disclose that such tracking includes tracking a facial portion and matching gray scale image data. The Board is respectfully requested to independently consider the patentability of dependent claim 12.

**xi. The cited references do not disclose the subject matter of dependent claim 15.**

Dependent claim 15 recites that a view-frustum is defined by a gaze projection of a location of the head through outer edges of a virtual window when the location of the head is normal to a center point of the virtual window. As discussed above with respect to independent claim 1, the cited references do not disclose such a feature. The Board is respectfully requested to independently consider the patentability of dependent claim 15.

**xii. The cited references do not disclose the subject matter of dependent claim 19.**

Dependent claim 19 recites that the method operation of translating a view-frustum in accordance with the change in location of the head of the user includes shifting the scene defined through the view-frustum while maintaining a lateral orientation of the head to a view port. As discussed above, the cited references do not disclose the claimed method of translating a view-frustum. As such, the references also do not disclose that such translation includes shifting the scene while maintaining a lateral orientation of the head to a view port. The Board is respectfully requested to independently consider the patentability of dependent claim 19.

**xiii. The cited references do not disclose the subject matter of dependent claim 50.**

Dependent claim 50 recites that the computing device is configured to maintain a substantially normal gaze direction relative to a plane associated with the display screen for both the view-frustum and a view-frustum associated with the location change of the control object. As discussed above, the cited references do not disclose the claimed functionality of effecting alignment of the view-frustum in the opposite direction to a location change of a control object. As such, the references also do not disclose the maintenance of a substantially normal gaze direction relative to a plane associated with the display screen for both the view-frustum and a view-frustum associated with the location

change of the control object. The Board is respectfully requested to independently consider the patentability of dependent claim 50.

**xiv. The cited references do not disclose the subject matter of dependent claim 60.**

Dependent claim 60 recites that the change in viewing angle of the scene is a result of the detected movement of the head of the user to enable the interaction with the scene. As discussed above, the cited references do not disclose the claimed method of updating a gaze projection of a changed location of the head through outer edges of the virtual window. As such, the references also do not disclose that the change in viewing angle is a result of such movement of the user's head. The Board is respectfully requested to independently consider the patentability of dependent claim 60.

**B. Conclusion**

In view of the foregoing reasons, the Appellants submit that each of claims 1, 6-12, 14-19, 46-50, and 59-61 are patentable. Therefore, the Appellants respectfully request that the Board of Patent Appeals and Interferences reverse the Examiner's rejections of the claims on appeal.

Respectfully submitted,
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## VIII. CLAIMS APPENDIX

1. A method for processing interactive user control for a view of a scene displayed on a virtual window, comprising:

identifying a head of a user that is to interact with the scene;

storing an initial frame of user image data representing the head of the user, said view of the scene comprises a view-frustum initially defined by a gaze projection of a location of the head through outer edges of the virtual window when the location of the head is substantially normal to about a center point of the virtual window;

tracking the identified head of the user during display of the scene, the tracking enabling detection of a change in location of the head of the user, the tracking including,

identifying a search region within a frame of the user image data; and

comparing values within the search region to template values of the stored initial frame of image data;

adjusting the view-frustum in accordance with the change in location of the head of the user, the adjusting of the view-frustum being in response to tracking a move in the location of the head away from normal relative to the center point of the virtual window, the adjusted view-frustum defined by an updated gaze projection of the changed location of the head through the outer edges of the virtual window, such that the view-frustum moves in a direction opposite to the move in the location of the head;

adjusting a scale of the scene according to a change in a distance of the head of the user from a capture device; and

repeating the identifying the search region, the comparing, and the adjusting for successive frames of the scene, wherein the comparing is performed with the stored initial frame of image data.

2. - 5. (Cancelled).

6. The method of claim 1, wherein successive frames are compared to determine a relative distance of the head of the user to manipulate the scale of the scene.

7. The method of claim 1, wherein the capture device has depth capturing capability.

8. The method of claim 1, wherein the initial frame of image data is marker-less.

9. The method of claim 1, wherein the initial frame of data is maintained throughout the scene.

10. The method of claim 1, wherein the scene is of a video game.

11. The method of claim 10, wherein the interaction with the scene by tracking movement of the head of the user is independent of user hand-held controls for interacting with the video game.

12. The method of claim 1, wherein the method operation of tracking the identified head of the user during display of the scene includes,

tracking a facial portion of the head; and

matching gray scale image data associated with the facial portion to image associated with a template of the facial portion.

13. (Canceled).

14. A method for processing interactive user control with a scene, comprising:

identifying a head of a user that is to interact with the scene;

storing an initial frame of image data representing the head of the user for a duration of the scene;

tracking the identified head of the user during display of the scene, the tracking enabling detection of a change in location of the head of the user, the tracking including,

identifying a search region within a frame of the image data; and

comparing values within the search region to template values of the initial frame of image data;

translating a view-frustum in a direction opposite to the change in location of the head of the user while maintaining a focus on an object in the scene through adjustment of a view port size;

adjusting a scale of the scene according to a change in a distance of the head of the user from a capture device; and

successively updating the view frustum according to the change in location of the head of the user relative to the initial frame of image data.

15. The method of claim 14, wherein a view-frustum is defined by a gaze projection of a location of the head through outer edges of a virtual window when the location of the head is normal to a center point of the virtual window.

16. The method of claim 15, wherein translating the view-frustum maintains the virtual location of the head normal to the center point of the virtual window.

17. The method of claim 15, wherein the translating enables a change in the scene provided through the virtual window.

18. The method of claim 14, wherein the method operation of tracking the identified head of the user during display of the scene includes,

scanning a portion of each frame in the image data for the identified head.

19. The method of claim 14, wherein the method operation of translating a view-frustum in accordance with the change in location of the head of the user includes,

shifting the scene defined through the view-frustum while maintaining a lateral orientation of the head to a view port.

20. - 45. (Cancelled).

46. A system enabling interactive user control for defining a visible volume being displayed, comprising:

a computing device;

a display screen in communication with the computing device, the display screen configured to display image data defined through a view-frustum;

a tracking device in communication with the computing device, the tracking device capable of capturing a location change of a control object, wherein the location change of the control object effects an alignment of the view-frustum in the opposite direction relative to the display screen, wherein the computing device stores a marker-less reference image of the control object for comparison to each successive frame of image data captured through the tracking device and wherein the computing device adjusts a scale of the display image data according to a change in a distance of the control object from the tracking device, wherein the computing device is configured to adjust a view port size associated with the image data so that when the view frustum is adjusted, focus on an object within the view-frustum is maintained.

47. The system of claim 46, wherein the tracking device is a camera.

48. The system of claim 46, wherein the computing device is a video game console.

49. The system of claim 46, wherein the computing device is configured to map coordinates associated with the location change of the control object to a view change associated with a camera position.

50. The system of claim 46, wherein the computing device is configured to maintain a substantially normal gaze direction relative to a plane associated with the display screen for both the view-frustum and a view-frustum associated with the location change of the control object.

51. - 58. (Cancelled)

59. A method for processing interactive user control for a view of a scene displayed on a virtual window, comprising:

identifying a head of a user that is to interact with the scene;

storing an initial frame of user image data representing the head of the user, said view of the scene comprises a view-frustum initially defined by a gaze projection of a location of the head through outer edges of the virtual window when the location of the head is substantially normal to about a center point of the virtual window;

tracking the identified head of the user during display of the scene, the tracking enabling detection of a change in location of the head of the user, the tracking including;

laterally adjusting the view-frustum in a direction opposite to the change in location of the head of the user, the lateral adjusting of the view-frustum being in response to tracking a move in the location of the head away from normal relative to the center point of the virtual window, the laterally adjusted view-frustum defined by an updated gaze projection of the changed position of the head through the outer edges of the virtual window;

adjusting a scale of the scene according to a change in a distance of the head of the user from a capture device, the capture device having depth capturing capability; and wherein the location of the head being away from normal relative to the center point of the virtual window changes an angle of the gaze projection, the change in angle of the gaze projection effects a change in viewing angle of the scene provided by a video clip.

60. The method of claim 59, wherein the change in viewing angle of the scene is a result of the detected movement of the head of the user to enable the interaction with the scene.

61. A method for processing interactive user control for a view of a scene displayed on a virtual window, comprising:

identifying a head of a user that is to interact with the scene;

storing an initial frame of user image data representing the head of the user, said view of the scene comprises a view-frustum initially defined by a gaze projection of a virtual viewpoint through outer edges of the virtual window when a location of the head is substantially normal to about a center point of the virtual window;

tracking the identified head of the user during display of the scene, the tracking enabling detection of a change in location of the head of the user, the tracking including,

laterally adjusting the virtual viewpoint in a same direction as a move in the location of the head away from normal relative to the center point of the virtual window, so as to laterally adjust the view-frustum in a direction opposite to the lateral adjustment of the virtual viewpoint, the laterally adjusted view-frustum defined by an updated gaze projection of the laterally adjusted virtual viewpoint through the outer edges of the virtual window;

adjusting a scale of the scene according to a change in a distance of the head of the user from a capture device.

# IX. EVIDENCE APPENDIX

There is currently no evidence entered and relied upon in this Appeal.

## X. RELATED PROCEEDINGS APPENDIX

There are currently no decisions rendered by a court or the Board in any proceeding identified in the Related Appeals and Interferences section.